

## 16-14-060 Geotechnical/Geologic Report Standards.

This section describes requirements for site-specific geologic hazard studies and geotechnical reports, where required according to the Sensitive Area Overlay Zone and the Land Use Management Code.

1. An engineering geology report or a geotechnical engineering report that includes a geologic hazards investigation and assessment shall be prepared by a qualified engineering geologist and/or professional engineer. The report shall be site-specific and shall identify all known or suspected potential geologic hazards, originating on-site or off-site, whether previously mapped or unmapped, that may affect the particular property. All reports shall be signed and stamped by the preparer in the form of an active Professional Geologist and/or Professional Engineer license registered in the State of Utah and include the qualifications of the preparer.
2. The final grading plan for the development must be signed and sealed by the Professional Engineer or Professional Geologist that prepared the Geotechnical/Geologic Report to verify that their recommendations have been incorporated and that the building location is approved. An appropriately signed and sealed addendum from the Professional Engineer or Professional Geologist that prepared the Geotechnical/Geologic Report may be filed with the final grading plan in lieu of the Professional Engineer or Professional Geologist that prepared the Geotechnical/Geologic Report signing and sealing the grading plan.
3. If an application for subdivision approval (including PUD, PRUD, commercial subdivision, standard residential subdivision, etc.) does not specifically address geologic hazards on each individual building lot, lots may be designated as restricted lots on the final plat in which further geologic and/or geotechnical study will be required in accordance with this chapter prior to issuance of a building permit for said lots.
4. Debris flow hazard studies and reports shall include test pits or trench logs, include estimates of the number and frequency of past events and their thicknesses, volume and maximum clast sizes; and include estimates of the recurrence, depth, and impact forces anticipated in future events. While debris flow hazard analyses may require contributions from hydrologists and engineers, the debris flow report shall be under the control of, and prepared by, a qualified engineering geologist, and shall include the geologist's qualifications to perform the study (such as their experience in performing similar studies).
5. Landslide reports shall be prepared in accordance with the Utah Geological Survey's "Guidelines for Evaluating Landslide Hazards in Utah" (Hylland, 1996). Landslide reports shall be prepared, signed, and stamped by a qualified engineering geologist, and include the qualifications of the preparer. Slope stability or other analyses included in these reports shall include both static and dynamic conditions, and shall be prepared by a qualified professional geotechnical engineer and shall include the professional engineer's original stamp and signature. Slope stability analyses shall be modeled such that the factor of safety of existing, active landslides shall be less than 1.0. This model shall then be used as a baseline for evaluating developed conditions. Back-calculated adjustments shall be made to piezometric surfaces, strength parameters, etc. to assure that the pre-developed condition in existing landslides is in accordance with landslide conditions in which the resisting forces are less than the driving forces. Those adjustments shall then be translated to the slope stability model for the developed conditions. Effective, residual soil strength parameters taken from actual laboratory testing of site soils must be used in the slope stability analysis in clay soil profiles.
  - A. Identified landslides within a proposed subdivision (including PUD, PRUD, commercial subdivision, standard residential subdivision, etc.) may not be subdivided. Lot lines must be located such that the landslide is located entirely within one lot.
  - B. Identified landslides may not be located in areas to be dedicated to Morgan County for public improvements unless properly stabilized. Conditional acceptance of the development will not be granted until the project geologist/geotechnical engineer certifies that the improvement is stabilized to an appropriate factor of safety.
  - C. Claims that a landslide is inactive must be substantiated by actual data derived from a study of the specific landslide in question.
  - D. The developer shall be required to stabilize landslide areas and other areas with unacceptable factors of safety if the developer intends to improve those areas.
6. Other geologic hazard or engineering geology reports shall be prepared in accordance with Utah Geological Survey Miscellaneous Publication M, "Guidelines for Preparing Engineering Geologic Reports in Utah." All reports shall be signed by the preparer and include the qualifications of the preparer. Generally, these reports must be prepared, signed, and stamped by a qualified engineering geologist. However, reports co-prepared by a professional engineer must include the professional engineer's original stamp and signature.
7. All reports shall include, at a minimum:
  - A. A 1:24,000-scale geologic map (with reference) showing the surface geology, bedrock geology (where exposed), bedding attitudes, faults or other structural features, and the locations of any geologic hazards;
  - B. An evaluation of recent aerial photographs for the potential presence of landslides and/or faults;
  - C. A review of published maps of the Utah Geologic Survey including the maps prepared by Coogan and King for

the Ogden/Snowbasin area that include portions of Morgan County;

- D. An accurate, detailed site map of the subject area showing any site-specific mapping performed as part of the geologic investigation, and including boundaries and features related to any geologic hazards, topography, and drainage. The site map must show the location and boundaries of the hazard(s), delineation of any recommended setback distances from hazard(s), and recommended location(s) for structures. Buildable and non-buildable areas shall be clearly identified. Scale shall be one inch equals one hundred feet or larger;
- E. A site geology map and geologic cross sections to illustrate local geologic structure;
- F. Trench logs, boring logs, and test pit logs (scale: 1 inch equals 5 feet, or larger), boring logs (scale: 1 inch equals 5 feet, or larger), references with citations, and other supporting information, as applicable. All trenches, borings, and test pits shall be logged to a minimum of 10' below the final proposed grade or to bedrock refusal, whichever is lesser;
- G. Conclusions that summarize the characteristics of the geologic hazards, and that address the potential effects of the geologic conditions and geologic hazards on the proposed development and occupants thereof in terms of risk and potential damage;
- H. Specific recommendations for additional or more detailed studies, as may be required to understand or quantify the hazard, evaluate whether mitigation measures are required, and evaluate mitigation options;
- I. Specific recommendations for avoidance or mitigation of the effects of the hazard(s), consistent with the purposes set forth in Chapter 16-14-010 shall be included in the report. These recommendations shall include design or performance criteria for engineered mitigation measures and all supporting calculations, analyses, modeling or other methods, and assumptions. Final design plans and specifications for engineered mitigation must be signed and stamped by a qualified professional licensed geotechnical or structural engineer, as appropriate;
- J. Evidence on which recommendations and conclusions are based shall be clearly stated in the report;
- K. Historical groundwater highs and lows must be indicated in the report. Any vegetation or surface features that indicate perennially wet conditions or surface creep shall be identified in the report;
- L. Additional or more detailed studies may be required to understand or quantify the hazard, or to evaluate whether mitigation measures recommended in the report are adequate;
- M. The report must include the responsible professional's specific opinion regarding the suitability of the site for the proposed development.